University of Illinois
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(1)

August 21, 1994

Scientific Officer
Code 1132P
Office of Naval Research
800 North Quincy Street
Arlington, VA 22217-5660

Re: Annual Evaluation Reports and Technical Report
for Grant N00014-93-1-1206 (AASERT)

Dear Dr. Goldwasser:

Enclosed please find Annual Evaluation Reports for Year 1 of the referenced ASSERT grant as well as a 1-page Technical Report. Faculty members from both the AAE Department (R.L. Burton) and the MIE Department (H. Krier) advise the two graduate students.

If any further information is required please contact me at (217)244-7139 or staci@uxh.cso.uiuc.edu.

Sincerely,

Staci L. Tankersley
Assistant to the Head
AAE Business Office

Enclosures

xc: Prof. R.L. Burton, AAE Dept.
Mr. J.J. Kamerer, UIUC Grants & Contracts Office
Prof. H. Krier, MIE Dept.
J.A. Oberg, MIE Business Office

Administrative Grants Officer
Office of Naval Research
Resident Representative
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Arlington, VA 22217-5660

Director, Naval Research Laboratory
Attn.: Code 2627
Washington, DC 20375

Defense Technical Information Center
Building 5, Cameron Station
Alexandria, VA 22304-6145

FORM A2-2

AUGMENTATION AWARDS FOR SCIENCE & ENGINEERING RESEARCH TRAINING (AASERT) REPORTING FORM

The Department of Defense (DOD) requires certain information to evaluate the effectiveness of the AASERT program. By accepting this Grant Modification, which bestows the AASERT funds, the Grantee agrees to provide the information requested below to the Government's technical point of contact by each annual anniversary of the AASERT award date.

1. Grantee identification data: *(R & T and Grant numbers found on Page 1 of Grant)*

a. University of Illinois at Urbana-Champaign
University Name

b. N00014-93-1-1206
Grant Number

c. 4326846---03
R & T Number

d. R.L. Burton & H. Krier
P.I. Name

e. From: 8/21/93 To: 8/20/94
AASERT Reporting Period

NOTE: Grant to which AASERT award is attached is referred to hereafter as "Parent Agreement."

2. Total funding of the Parent Agreement and the number of full-time equivalent graduate students (FTEGS) supported by the Parent Agreement during the 12-month period prior to the AASERT award date.

a. Funding: $ 0

b. Number FTEGS: 0

3. Total funding of the Parent Agreement and the number of FTEGS supported by the Parent Agreement during the current 12-month reporting period.

a. Funding: $ $63,873

b. Number FTEGS: .083

4. Total AASERT funding and the number of FTEGS and undergraduate students (UGS) supported by AASERT funds during the current 12-month reporting period.

a. Funding: $ $87,084

b. Number FTEGS: 2

c. Number UGS: 0

VERIFICATION STATEMENT: I hereby verify that all students supported by the AASERT award are U.S. citizens.

Herman Haken / Rodney L Burton
Principal Investigator

8/21/94
Date

ONR-AASERT Technical Report--Student Progress

High Pressure Metal Combustion Applied to Underwater Explosions
AASERT Grant Number N00014-93-1-1206

for the period August 21, 1993 - August 20, 1994

prepared by R. L. Burton, AAE Dept. and H. Krier, MIE Dept., University of Illinois
104 S. Wright St., Urbana, IL 61801

A. Robert O. Foelsche

Mr. Foelsche's grades are excellent. He has a 4.9 out of 5.0 grade point average.

His research progress is excellent. After assisting Stephen Pirman move the shock tube (see below), he began the design of a high pressure combustion bomb for boron combustion studies, the fabrication of which has been recently completed. Installation is now underway, and the first shot is anticipated for early September, 1994. The 1.5 liter bomb has a peak design pressure of 50,000 psi (3400 atm), and can be charged with a hydrogen-oxygen helium mixture to an initial pressure of 3000 psi. Mr. Foelsche has designed and supervised fabrication of auxiliary systems including control, charging and exhaust tank systems, spark igniter, fiber optic window for OMA studies, piezoelectric pressure probe, and temperature probe.

Mr. Foelsche has also reviewed the boron combustion literature, and has performed chemical kinetics calculations for mixtures of interest. He passed his AAE departmental Ph. D. preliminary examination in June, 1994. It is anticipated that his thesis will be completed by December, 1995.

B. Stephen R. Pirman

Mr. Pirman's grades as a graduate student have been very good. He has a 4.75 out of 5.0 average and has completed all his coursework toward his Masters of Engineering degree. Within a month he will have submitted his Master's thesis, entitled "Shock Tube Ignition Experiments on Boron Powder." Steve now plans to take an engineering position as an aerothermodynamiscist.

The work being reported in his thesis is excellent research, resulting in new findings which will have major consequences in the utilization of the energetic additive, i.e. boron metal. We expect to submit his work as a paper for the next AIAA Thermophysics Conference; abstracts are due by September 19, 1994.

Prior to carrying out his experimental studies, Steve (with AASERT graduate student, Rob Foelsche) had to completely dismantle the shock tube and all the support equipment and instruments, move them to a new building, and reassembe the entire facility. Mr. Pirman was also the project director for the Hydrogen Fluoride Facility, and wrote an excellent safety checklist which now allows our group to safely handle large quantities of HF gas, both in the Shock Tube and the Detonation Chamber.

C. Martin Spalding

Mr. Spalding will begin as a Ph. D. candidate on August 21, 1994, placing Steve Pirman. Mr. Spalding ranked first in his senior engineering class in the MIE Dept, UIUC, May 1994.